Chapter 1

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Understanding Watersheds

What is a Watershed?

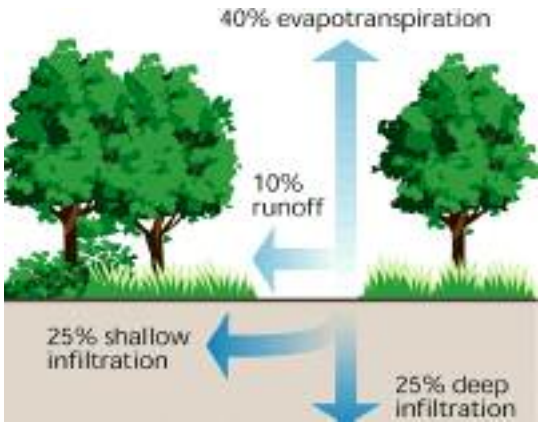
A watershed is an area of land in which all the water drains into a particular low-lying river or other surface water body. The boundaries of a watershed are determined by higher areas of land which separate it from adjacent watersheds. There are 27 watersheds in Massachusetts and within each of these are the smaller watersheds of each lake or pond. Within each lake's or pond's watershed, all the water in that area flows to the lowest point, the water body.

Since all the land in a watershed drains into a water body, every activity in that watershed ultimately has an impact. In undisturbed or natural areas, the majority of water is either absorbed by vegetation or infiltrates down through the soil and replenishes underlying groundwater. As the water passes through the layers of earth, many harmful toxins, nutrients and sediments are filtered out.

This cycle changes when an area is developed or altered. Impervious surfaces including pavement, buildings and other man-made constructions, prevent the infiltration of water into the ground. Instead, precipitation travels primarily across the impervious surfaces as runoff (see graphic below). Often, as storm water races over impervious surfaces it attains velocity, causing erosion and collecting pollutants. Storm water, loaded with sediments, toxins and nutrients, may flow untreated into nearby lakes and ponds.

Picture a drop of water falling near the summit of a mountain. As the droplet begins to travel down the mountainside it may pick up sediments and oil residue as it trickles over a road. The droplet continues to wind its way downward through a garden collecting pesticide residues, fertilizer and waste from a pet, and eventually enters a lake, stream or pond. This type of pollution is called non-point source pollution because the pollution did not enter the lake from a single identifiable location, such as a sewage pipe; instead, the pollution came from multiple locations.

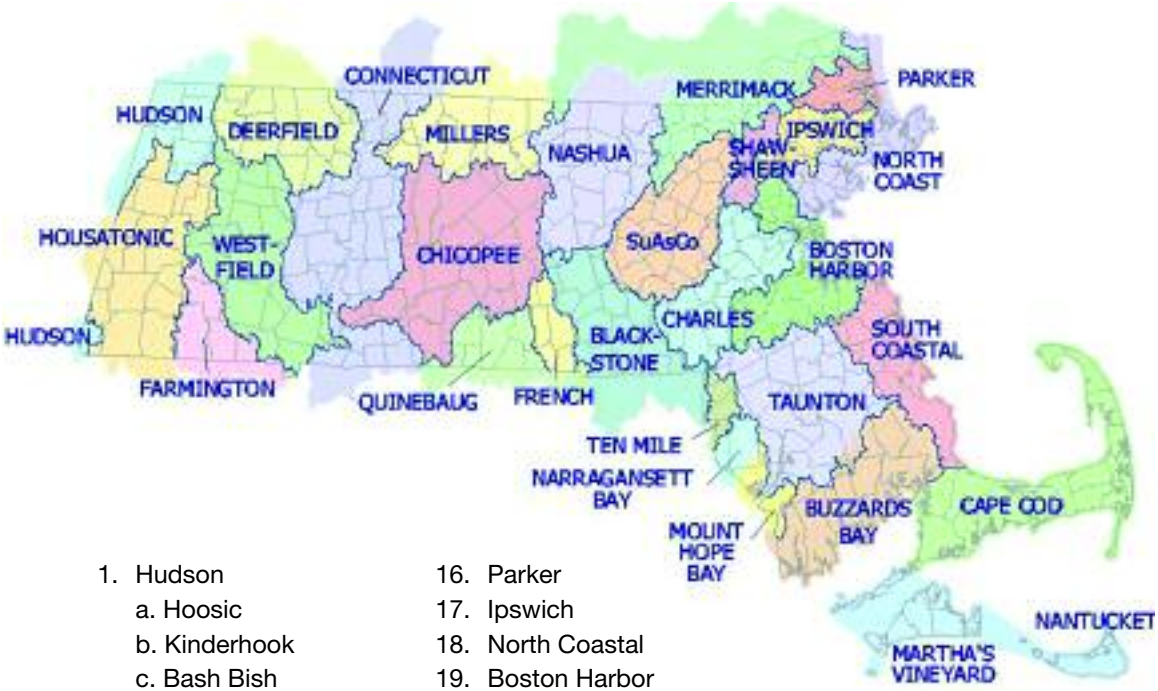
When trying to maintain a healthy lake it is important to monitor all the activities within the watershed and to prevent nutrients, such as phosphorus, sediments and other forms of pollution from draining into a lake. Storm water pollutants are covered in greater detail in Chapter 3 and treatments for storm water are discussed in Chapter 4.



Natural Ground Cover: 10% runoff

75-100% Impervious Surface: 55% runoff

Watersheds of Massachusetts



1. Hudson
   a. Hoosic
   b. Kinderhook
   c. Bash Bish
2. Housatonic
3. Deerfield
4. Westfield
5. Farmington
6. Connecticut
7. Millers
8. Chicopee
9. Quinebaug
10. French
11. Nashua
12. Blackstone
13. Merrimack
14. Concord
    a. Assabet
    b. Concord & Sudbury
15. Shawsheen
16. Parker
17. Ipswich
18. North Coastal
19. Boston Harbor
    a. Mystic
    b. Neponset
    c. Weymouth & Weir
20. Charles
21. South Costal
    a. North & South Rivers
    b. South Coastal Shore
22. Cape Cod
23. Islands
24. Buzzards Bay
25. Taunton
26. Narragansett Bay & Mt. Hope Bay Shore
27. Ten Mile

Massachusetts Watershed Approach

While many land and water resource managers have used the watershed as a resource management and planning unit for many years, the Commonwealth formally adopted a watershed approach in 1994. This EOEA initiative helped focus state and local resources on developing a better understanding of our natural resources and seeking improvements in protecting and restoring them in measurable ways. It also educated many community officials and citizens about the value of planning and managing resources on a watershed basis.

Then, in 2000, EOEA launched the Lakes and Ponds Watershed Action Strategy for the Commonwealth, a watershed approach focused on lakes and ponds management. Under this program, DCR lakes and ponds staff have worked with communities to identify immediate actions that could be taken to improve lake and pond protection efforts and to integrate these efforts with Massachusetts' watershed approach.

This effort also reaffirmed the existing Lakes and Ponds Policy of the Commonwealth, which states:

Massachusetts advocates a holistic approach to lake and pond management and planning, which integrates watershed management, in-lake management, pollution prevention and education. Lake management in Massachusetts will be designed with consideration of the quality of the lake's ecosystem, its designated uses and other desired uses, the ability of the ecosystem to sustain those uses, and the long term costs, benefits and impacts of available management options.

The Lakes and Ponds Watershed Action Strategy has involved individuals and groups across the state in lake and pond protection and restoration in order to promote local stewardship for these valuable Commonwealth resources. Efforts have included education at the local level to curb invasive species, development of an invasive species response team, and funding demonstration projects for innovative approaches to lake management.